

Printed Pages : 3



NOE047

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 199437

Roll No.

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B. Tech.

(SEM. IV) THEORY EXAMINATION, 2014-15
MATERIAL SCIENCE

Time : 3 Hours]

[Total Marks : 100

Note: Attempt all questions

- 1 Attempt any four parts of the following:- $5 \times 4 = 20$
- A. State and Explain Bohr's model of an electron in an atom.
 - B. Classify various types of bonds and illustrate their examples.
 - C. What are miller indices? How are they determined?
 - D. Differentiate between edge dislocation and screw dislocation. Illustrate with sketches.
 - E. Show the atomic packing factor of FCC crystal structure is 0.74.
 - F. Briefly describe X-ray crystallography methods.

- 2 Attempt any four parts of the followings:- $5 \times 4 = 20$
- A. What is stress-strain diagram? Explain various factor affecting stress-stain diagram.
 - B. Define creep. Explain its phase and mechanism.
 - C. Differentiate between toughness and hardness.
 - D. Explain the term percentage elongation on proof stress.
 - E. Enumerate different kind of destructive testing. Explain any of them in detail.
 - F. Draw a neat labeled sketch of iron-carbon equilibrium diagram.
- 3 Attempt any two parts of the followings:- $10 \times 2 = 20$
- A. Explain Time-Temperature-Transformation (TTT) diagram.
 - B. What is 'heat treatment'? Why are steels heat treated? Describe various heat-treatment processes.
 - C. Name any five alloys of ferrous and non-ferrous metals. Write their composition, properties and application.
- 4 Attempt any two parts of the followings:- $10 \times 2 = 20$
- A. Compare the properties of diamagnetic and ferro-magnetic materials. Also write what are hard and soft magnetic materials? Explain with reference to hysteresis loop.
 - B. Describe various types of semiconductor, its device and its applications.
 - C. Explain P-N Junction and Transistor in detail.

- 5 Attempt any two parts of the followings:- $10 \times 2 = 20$
- A. Discuss various types of plastics and their application.
 - B. Write a short note on:-
 - (1) Composite materials and its application
 - (2) Corrosion and its prevention
 - C. What are smart material? Discuss optical fiber.
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